

**BRITISH STANDARD**

# **Code of practice for the safe use of construction hoists**

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# Contents

Foreword *iii*

|           |                                                                                        |           |
|-----------|----------------------------------------------------------------------------------------|-----------|
| <b>1</b>  | Scope                                                                                  | <i>1</i>  |
| <b>2</b>  | Normative references                                                                   | <i>1</i>  |
| <b>3</b>  | Terms and definitions                                                                  | <i>1</i>  |
| <b>4</b>  | Hoist types                                                                            | <i>4</i>  |
| <b>5</b>  | Hazards associated with the use of hoists                                              | <i>13</i> |
| <b>6</b>  | Management of the hoist installation                                                   | <i>14</i> |
| <b>7</b>  | Personnel and training                                                                 | <i>21</i> |
| <b>8</b>  | Selection of hoists and related site considerations                                    | <i>26</i> |
| <b>9</b>  | Planning and siting of the hoist installation                                          | <i>30</i> |
| <b>10</b> | Erection, alteration and dismantling and provision of hoistway protection and landings | <i>35</i> |
| <b>11</b> | Hand-over, operation and use, maintenance and inspection of hoists                     | <i>39</i> |
| <b>12</b> | Thorough examination and testing of hoists                                             | <i>43</i> |

## Annexes

Annex A (informative) Checklist for pre-use checks of rack and pinion hoists and rope driven hoists *54*

Annex B (informative) Checklist for weekly inspections of rack and pinion hoists and rope driven hoists *55*

Annex C (informative) Examples of checklist and report forms *56*

Bibliography *64*

## List of figures

Figure 1 – Rack and pinion passenger/goods hoist *7*

Figure 2 – Rack and pinion goods hoist *8*

Figure 3 – Rope driven goods hoist *9*

Figure 4 – Inclined goods hoist *10*

Figure 5 – Swivel hoist *11*

Figure 6 – Transport platform *12*

Figure 7 – Hoistway protection and landings *38*

## List of tables

Table 1 – Minimum attributes of personnel *22*

Table 2 – Summary of examinations and testing and documentation *46*

## Summary of pages

This document comprises a front cover, an inside front cover, pages i to iv, pages 1 to 64, an inside back cover and a back cover.



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# Foreword

## Publishing information

This British Standard was published by BSI and came into effect on 31 July 2006. It was prepared by Technical Committee MHE/6, *Hoists of builders type*. A list of organizations represented on this committee can be obtained on request to its secretary.

## Supersession

This British Standard supersedes BS 7212:1989, which is withdrawn.

## Information about this document

This revision of BS 7212 has been prepared to take into account changes in legislation, in particular the introduction of the Lifting Operations and Lifting Equipment Regulations (LOLER) 1998 [1], and advances in technology.

Construction hoists are items of lifting equipment temporarily installed, guided and used to transfer persons and/or goods between defined landing levels on sites of engineering and construction.

This British Standard gives guidance and recommendations to enable construction hoists to be installed (erected, altered and dismantled), maintained, examined and used in a safe manner. It also sets out the responsibilities of all parties involved with those activities.

The Health and Safety Executive (HSE) commends the use of this British Standard to those who have duties under the Health and Safety at Work etc. Act 1974. This standard was drawn up with the participation of HSE representatives and will be referred to in the relevant HSE publications.

## Use of this document

As a code of practice, this British Standard takes the form of guidance and recommendations. It should not be quoted as if it were a specification and particular care should be taken to ensure that claims of compliance are not misleading.

Any user claiming compliance with this British Standard is expected to be able to justify any course of action that deviates from its recommendations

It has been assumed in the preparation of this British Standard that the execution of its provisions will be entrusted to appropriately qualified and experienced people, for whose use it has been produced.

## Presentation conventions

The provisions in this standard are presented in roman (i.e. upright) type. Its recommendations are expressed in sentences in which the principal auxiliary verb is “should”.

*Commentary, explanation and general informative material is presented in smaller italic type, and does not constitute a normative element.*

### **Contractual and legal considerations**

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

### **Compliance with a British Standard cannot confer immunity from legal obligations.**

Attention is drawn to the Lifting Operations and Lifting Equipment Regulations (LOLER) 1998 [1], the Provision and Use of Work Equipment Regulations (PUWER) 1998 [2], the Management of Health and Safety at Work Regulations 1999 [3], the Construction (Design and Management) Regulations 1994 [4] and the Work at Height Regulations 2005 [5].

# 1 Scope

This British Standard gives recommendations and guidance on the installation, maintenance, examination and operation of construction hoists, including hoistway protection, and on the management of these activities. It includes recommendations and guidance on erection, alteration and dismantling of hoists. It also sets out the responsibilities of the various parties involved in all these activities.

The standard is applicable to temporarily installed, powered construction hoists, having a carrier, the movement of which is restricted or guided by one or more masts. Such hoists are used to transfer persons and/or goods between defined landing levels on sites of engineering and construction. They are not intended for use as temporary working places giving variable height access to specific areas.

This British Standard is not applicable to permanently installed lifts or to mast climbing work platforms.

This British Standard does not give recommendations for the use of internal combustion engines for powering hoists.

*NOTE Examples of checklists for pre-use checking and weekly inspections of rack and pinion type and rope driven hoists are given in Annex A and Annex B and examples of checklist and report forms are given in Annex C.*

# 2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

BS EN 12158-1, *Builders hoists for goods – Part 1: Hoists with accessible platforms*

BS EN 12158-2, *Builders hoists for goods – Part 2: Inclined hoists with non-accessible load carrying devices*

BS EN 12159, *Builders hoists for persons and materials with vertically guided cages*

BS 7671, *Requirements for electrical installations – IEE Wiring Regulations 16th edition*

# 3 Terms and definitions

For the purposes of this British Standard, the following terms and definitions apply.

## 3.1 appointed person (supplier)

person appointed by the hoist supplier, who is responsible for all aspects of the supply of the hoist

## 3.2 appointed person (user)

person appointed by the management of the user organization, who is responsible for liaison with the appointed person (supplier) and the safe use of the hoist

**3.3 base frame**

part of a hoist that provides support for the mast and elevating assembly

**3.4 buffer**

resilient stop at the end of the travel of a hoist, comprising a means of arresting the movement of the hoist

*NOTE Buffers usually operate by means of fluid dampers or springs.*

**3.5 competent person**

person who is deemed to be competent and has such practical and theoretical knowledge and such experience of the construction hoist and its equipment as are necessary to carry out specific duties and responsibilities

**3.6 demonstrator**

person trained, and authorized by the appointed person (supplier), to demonstrate the controls and functions of the hoist to trained operators

**3.7 drop test**

test in which a hoist cage or platform is allowed to free fall in order to check the correct functioning of the overspeed safety device

**3.8 erection load**

maximum load permitted on the cage or platform of the hoist during the erection process, as specified by the hoist manufacturer

*NOTE This is normally less than the rated load for the hoist.*

**3.9 erection supervisor**

trained person, authorized by the appointed person (supplier), who is responsible for the erection, modification and dismantling of hoists and who is on site at all times that such work is taking place

*NOTE Also known in the industry as a “first man” or “lead erector”.*

**3.10 erector**

trained person, authorized by the appointed person (supplier), who carries out the erection, modification and dismantling of hoists under the direction of the erection supervisor

**3.11 guides**

parts of the mast which provide guiding for the hoist cage or platform

**3.12 hoistway**

total space which is travelled by a hoist cage or platform

**3.13 in service**

condition of a hoist in which the cage or platform (laden or unladen) is in a position other than at the lowest landing level, or in which the cage or platform is at the lowest landing level and laden

**3.14 landing**

area in a building or construction intended for loading and unloading the cage or platform of a hoist and to and from which persons can enter and leave the hoist

**3.15 mast**

structure that supports and guides the hoist cage or platform (and the counterweight when provided) outside of the mast structure

- 3.16 mast tie**  
anchorage system used to provide lateral restraint to the mast, anchored to the building or other structure
- 3.17 operator**  
trained person, authorized by the appointed person (user), who operates the hoist controls during its intended use
- 3.18 out of service**  
condition of a hoist in which the cage or platform is at the lowest landing level and unladen
- 3.19 oversail**  
unsupported section of the mast above the top tie
- 3.20 overspeeding**  
travelling at a speed above the rated speed
- 3.21 overspeed safety device**  
mechanical device for stopping, and holding stationary on the guides, the hoist cage or platform in the case of overspeeding
- 3.22 passenger**  
person transported by a hoist  
*NOTE This includes the driver of the hoist.*
- 3.23 rated load**  
maximum load a hoist cage or platform has been designed to carry in normal operation
- 3.24 rated speed**  
maximum travel speed of the cage or platform at which the hoist has been designed to run
- 3.25 standoff distance**  
horizontal distance between the landing side of the gate or barrier and any travelling part of the hoist in normal operation  
*NOTE "Standoff distance" is the term used in the UK. This is referred to as "safety distance" in BS EN 12158-1 and BS EN 12159.*
- 3.26 terminal stopping switch**  
switch, or combination of switches, arranged to bring the hoist cage or platform to rest automatically at or near a terminal landing, independently of the functioning of the operating control device
- 3.27 ultimate limit switch**  
emergency switch arranged to stop the hoist automatically, in the event of the cage or platform travelling a predetermined distance beyond a terminal landing
- 3.28 user organization**  
body that procures a hoist and is responsible for its use

## 4 Hoist types

### 4.1 General

Descriptions of the hoist types most commonly used are given in **4.2**, **4.3**, **4.4**, **4.5** and **4.6**. Hoists conforming to BS EN 12158-1, BS EN 12158-2 or BS EN 12159 should be used, as applicable. Effective hoistway protection is essential for all types of hoists.

### 4.2 Rack and pinion driven hoists

#### 4.2.1 General

Rack and pinion driven hoists consist of a carrier (cage or platform), raised and lowered by means of one or more rotating pinions meshing with a continuous rack fixed to, and parallel with, one or more supporting structural masts. The supporting mast or masts act as the guide for the carrier and can be free-standing up to a limited height, above which ties, anchored at regular intervals to the building or structure, are required to support them. These hoists are sometimes equipped with wire rope-suspended counterweights.

#### 4.2.2 Rack and pinion passenger/goods hoists

Rack and pinion passenger/goods hoists have a fully enclosed cage to protect the passengers (see Figure 1). Cage gates and landing gates are required to be interlocked. Goods, as well as passengers, can be transported in the cage provided that the rated load is not exceeded. The hoist can be controlled from the cage, or from one or more landing control stations.

*NOTE See BS EN 12159.*

#### 4.2.3 Rack and pinion goods hoists

Rack and pinion goods hoists have a platform fitted with sides to retain the load on the platform (see Figure 2). Persons are not allowed to travel on the platform when the hoist is in normal use. Depending on the design, and provided that suitable edge protection is provided, persons may be permitted to walk onto the platform while it is stationary for purposes of loading and unloading only.

When in service, it should only be possible for the hoist to be operated from one position at any one time. This control position is normally at base level. However, it can be at another position or level which affords good visibility over the entire range of travel. Platform gates and landing gates are required to be interlocked.

*NOTE See BS EN 12158-1.*

## 4.3 Rope driven hoists

### 4.3.1 General

Rope driven hoists consist of a carrier raised and lowered by means of a steel wire rope or ropes (see Figure 3). The most common drive mechanism is a wire rope winding drum, without a counterweight. The supporting mast, or masts, act as the guide for the carrier and can be freestanding up to a limited height, above which ties, anchored at regular intervals to the building or structure, are required to support them.

### 4.3.2 Rope driven passenger/goods hoists

Rope driven passenger/goods hoists are power driven for both raising and lowering the cage. The descent is therefore always controlled.

The cage is suspended by at least two independent steel wire ropes and the drive units are normally located at ground level. Passengers travel inside a fully enclosed cage. Cage gates and landing gates are required to be interlocked.

Goods, as well as passengers, can be transported in the cage provided that the rated load is not exceeded. Hoists of this design are not widely used in the United Kingdom.

*NOTE See BS EN 12159.*

### 4.3.3 Rope driven goods hoists

Rope driven goods hoists have a platform fitted with sides to retain the load on the platform. Persons are not allowed to travel on the platform when the hoist is in normal use. Depending on the design, and provided that suitable edge protection is provided, persons may be permitted to walk onto the platform while it is stationary for purposes of loading and unloading only.

The platform is suspended by one steel wire rope and is raised and lowered by a winch, normally situated at ground level. The winch drum is positively driven in both directions.

When in service, it should only be possible for the hoist to be operated from one position at any one time. This control position is normally at base level. However it can be at another position or level which affords good visibility over the entire range of travel. Platform gates and landing gates are required to be interlocked.

*NOTE See BS EN 12158-1.*

#### **4.4 Inclined goods hoists**

Inclined goods hoists are designed to lift on an incline rather than vertically. Examples of this type of hoist are roof tile carriers and ladder hoists. These hoists have one upper landing or a defined work area. They have a guided platform or special carrier which travels on an inclined mast. The mast can be either fixed or telescopic. These hoists can be either wire rope or rack and pinion type.

When in service, it should only be possible for the hoist to be operated from one position at any one time. This control position is normally at base level. However, it can be at another position or level which affords good visibility over the entire range of travel. These inclined hoists do not normally require landing gates but do require suitable landing edge protection.

An example of an inclined goods hoist is shown in Figure 4.

*NOTE See BS EN 12158-2.*

#### **4.5 Swivel hoists**

Swivel hoists are similar to rack and pinion goods hoists and rope driven goods hoists (see **4.2.3** and **4.3.3**), but have a platform which swivels between the travelling and the load transfer positions at the landing levels (see Figure 5). These hoists normally operate in a vertical configuration.

*NOTE See BS EN 12158-1.*

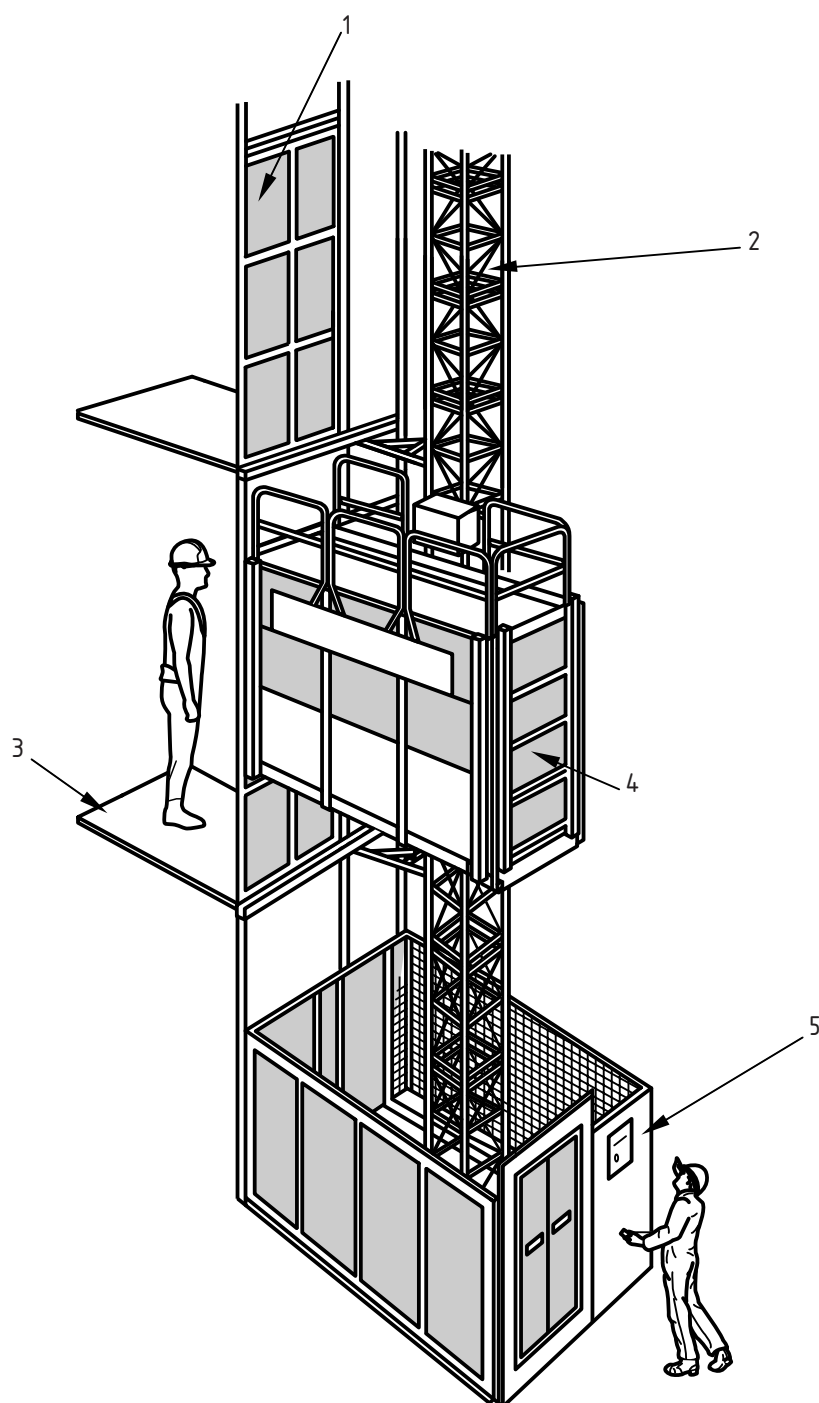
#### **4.6 Transport platforms**

Transport platforms are rack and pinion type hoists for the transportation of bulky goods and/or a restricted number of persons (see Figure 6). The platform is provided with reduced height, full width gates to facilitate the loading and unloading of these goods. A roof is provided to protect against falling objects. Platform gates and landing gates are required to be interlocked.

Since the platform is not fully enclosed, it runs at a restricted maximum speed of 12 m/min, with a minimum running clearance of 500 mm from the structure. The only controls are hold-to-run type located on the platform.

With these limitations, transport platforms are not replacements for the fast moving building hoist for the carriage of persons and goods described in **4.2**, **4.3**, **4.4** and **4.5**.

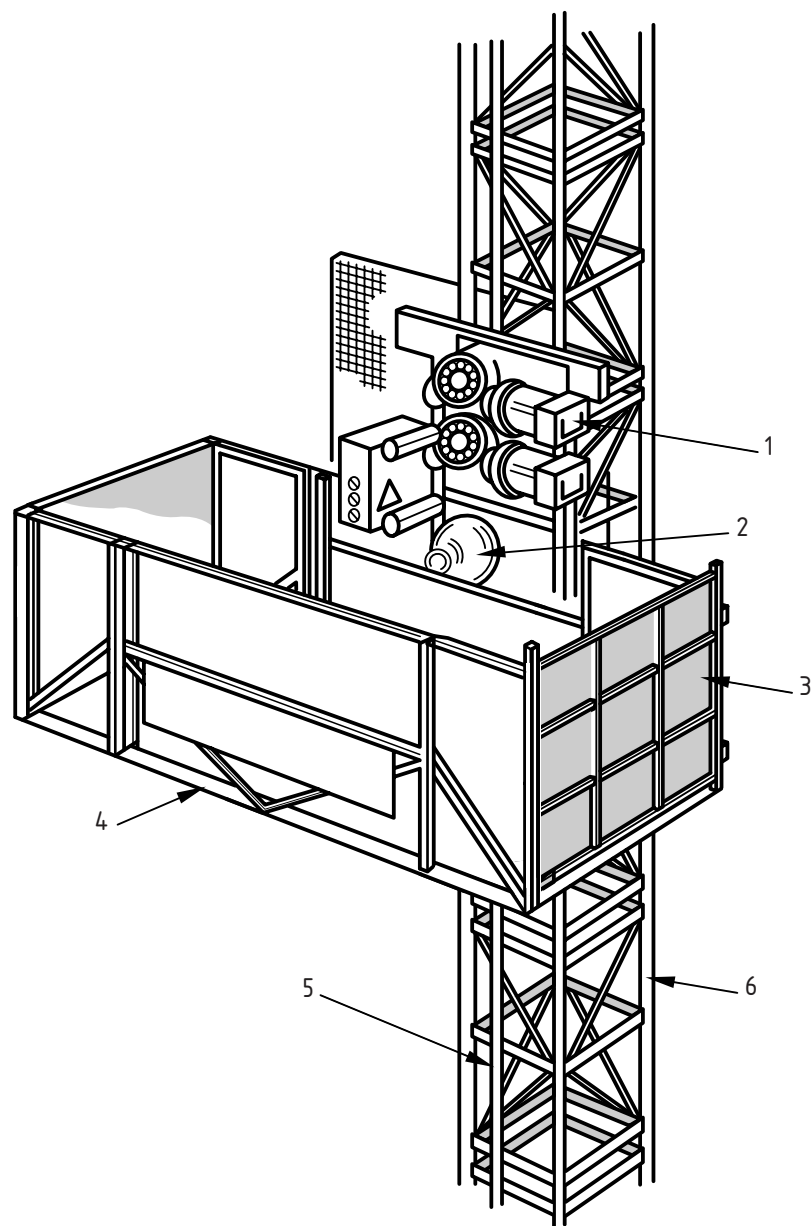
Figure 1 Rack and pinion passenger/goods hoist

**Key**

- 1 Landing gate
- 2 Mast
- 3 Landing
- 4 Enclosed cage
- 5 Base enclosure

*NOTE The drawing shows the main parts of the hoist structure for illustrative purposes only.*

Figure 2 Rack and pinion goods hoist



**Key**

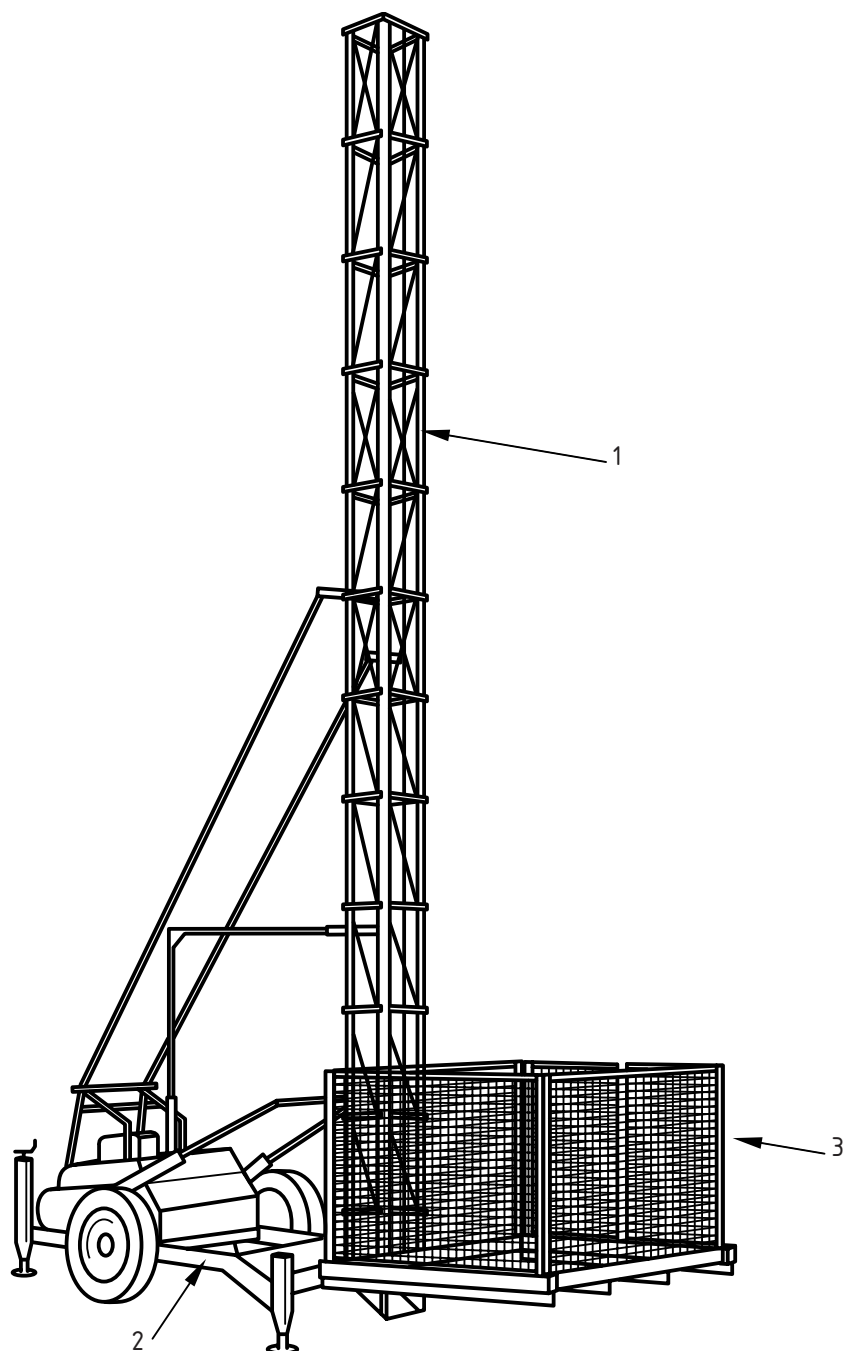
- 1 Motor
- 2 Overspeed safety device
- 3 Gate/ramp
- 4 Cage
- 5 Rack
- 6 Mast

*NOTE 1 This type of hoist is for the transport of goods only (see 4.2.3).*

*NOTE 2 The drawing shows the main parts of the hoist structure for illustrative purposes only.*

*NOTE 3 Protective back panel not shown for clarity.*

Figure 3 Rope driven goods hoist

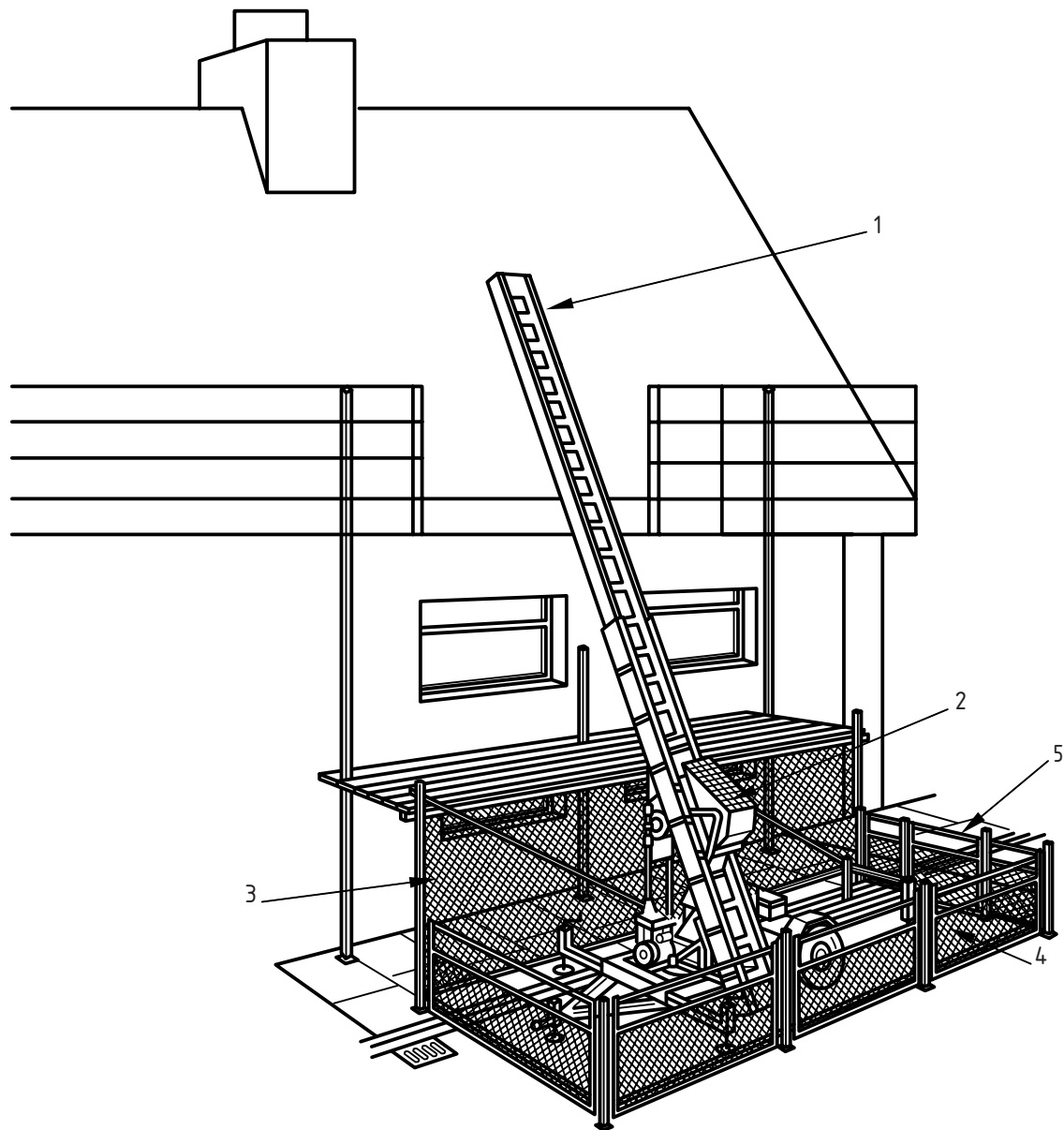
**Key**

- 1 Mast
- 2 Base frame
- 3 Cage

*NOTE 1 The drawing shows the main parts of the hoist structure for illustrative purposes only.*

*NOTE 2 Base enclosure not shown for clarity.*

Figure 4 Inclined goods hoist



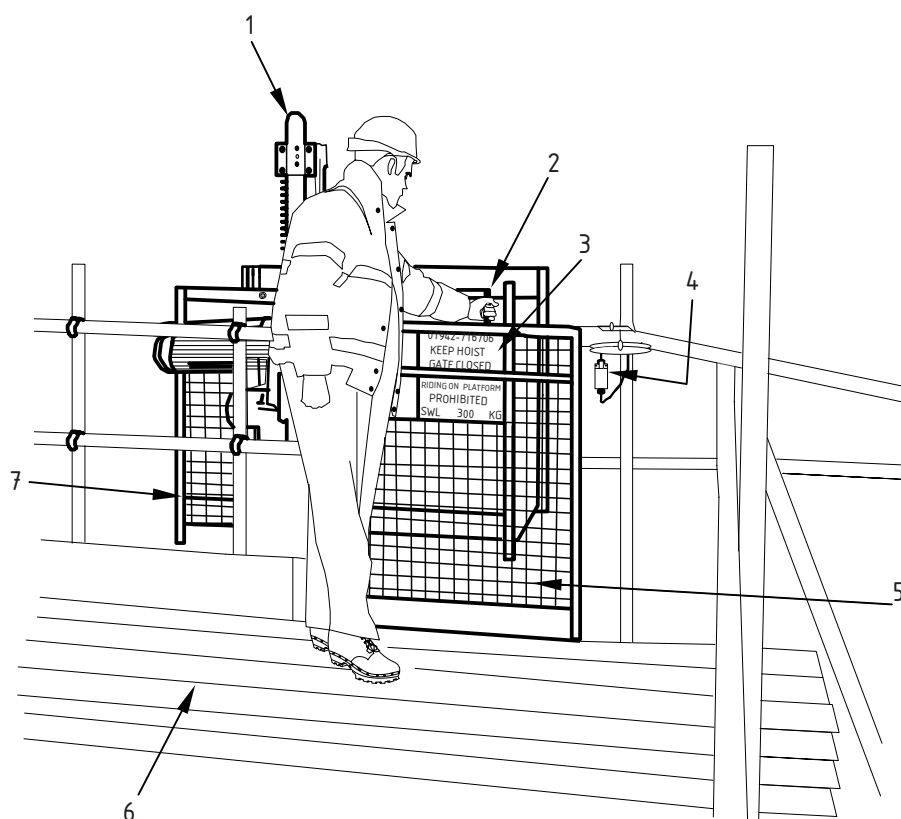
**Key**

- 1 Mast
- 2 Carrier
- 3 Pedestrian protection
- 4 Base enclosure
- 5 Gate

*NOTE 1 The drawing shows the main parts of the hoist structure for illustrative purposes only.*

*NOTE 2 This example shows a ladder hoist.*

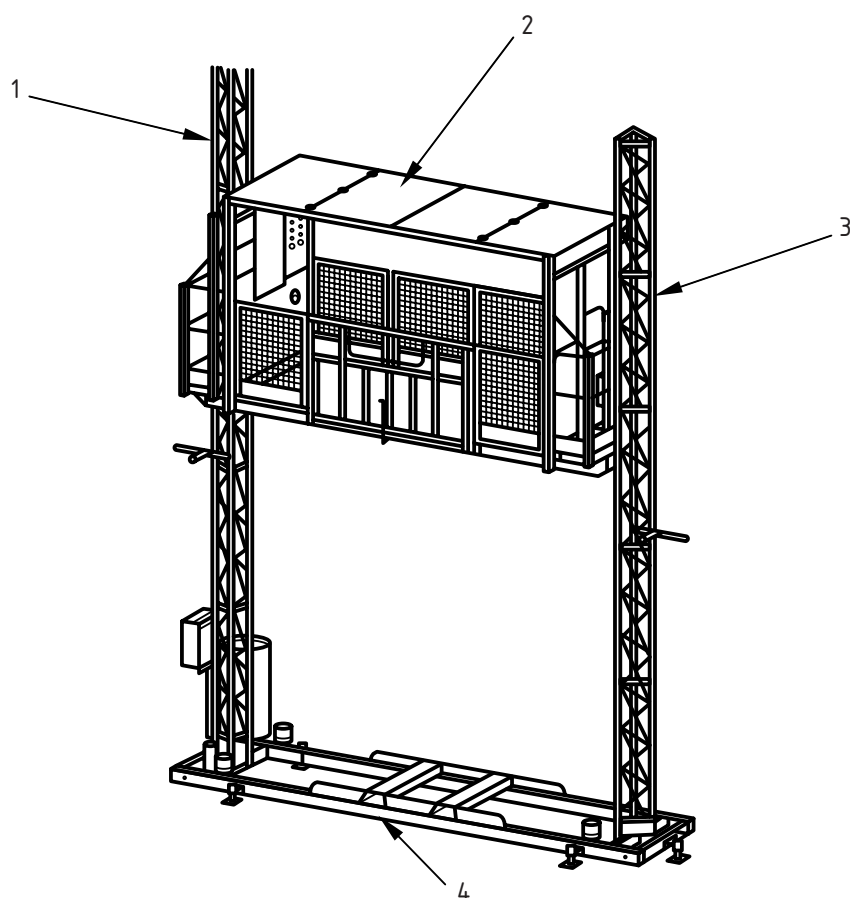
Figure 5 Swivel hoist

**Key**

- 1 Mast
- 2 Swivelling handle
- 3 Safety notice
- 4 Electrical interlock switch
- 5 Half height gate
- 6 Landing
- 7 Cage

*NOTE The drawing shows the main parts of the hoist structure for illustrative purposes only.*

Figure 6 Transport platform



**Key**

- 1 Mast
- 2 Cage with roof
- 3 Mast
- 4 Base frame

*NOTE 1 The drawing shows the main parts of the hoist structure for illustrative purposes only.*

*NOTE 2 Base enclosure not shown for clarity.*

## 5 Hazards associated with the use of hoists

### 5.1 General

The Management of Health and Safety at Work Regulations 1999 [3] require that suitable and sufficient risk assessments are carried out to identify the hazards associated with all aspects of hoist erection, modification and dismantling, use and maintenance. Recommendations and guidance on identification of the hazards associated with the use of hoists are given in 5.2 and 5.3.

**WARNING.** The hazards listed in 5.2 and 5.3 are examples only, of the hazards that need to be taken into account. There might be other hazards associated with a particular site or hoist configuration that also need to be taken into account.

### 5.2 Erection, alteration and dismantling

Hazards associated with erection, alteration and dismantling hoists include the following:

- a) working at a height;
- b) mechanical handling and lifting;
- c) falling objects e.g. materials and tools;
- d) instability of the mast due to failure to bolt up the mast sections correctly or due to failure to secure the mast ties correctly to the supporting structure;
- e) loss of stability of the hoist following the removal of the last ties during dismantling;
- f) manual handling of heavy items;
- g) loss of stability of the hoist following failure of the mast or the mast ties;
- h) movement of the drive mechanism and movement of the hoist, which could result in a person becoming trapped;
- i) exposed live electrical conductors;
- j) uncontrolled movement of the carrier due to overloading;
- k) hazards arising from the drilling of mast tie anchorages, for example, noise, dust, foreign objects, hand/arm vibration;
- l) uncontrolled ascent or descent of the carrier;
- m) unexpected movement of the carrier;
- n) wet and/or uneven surfaces which can cause persons to slip or trip;
- o) environmental hazards such as low lighting levels, extremes of temperature, rain and wind;
- p) hazards arising from failure to follow the manufacturer's instructions.

### 5.3 Operation and maintenance

Hazards associated with operation and maintenance of hoists include the following:

- a) hazards arising from unauthorized or inappropriate use, or from misuse, of the hoist;
- b) hazards arising from unauthorized modifications, alterations or additions to the hoist;
- c) hazards arising from overloading of the carrier;
- d) hazards arising from inappropriate loading of the carrier e.g. eccentric loading, unsecured loading, point loading, loads protruding outside the confines of the carrier;
- e) tools, materials, etc. falling from, or on to, the platform;
- f) moving parts of the hoist which could strike a person or in which they could become trapped or entangled;
- g) moving parts of the hoist which could trap a person between the hoist and a fixed obstruction such as the building or a piece of scaffolding;
- h) the carrier being stuck in a raised position due, for example, to a power or control circuit failure, which could result in a person being stranded on it;
- i) uncontrolled ascent or descent of the carrier;
- j) exposed live electrical conductors;
- k) hazards arising from failure to operate, maintain or inspect the hoist in accordance with the manufacturer's instructions;
- l) environmental hazards such as low lighting levels, extremes of temperature, rain and wind.

In addition, users of a hoist and persons carrying out maintenance are at risk of slipping, tripping or falling when on the carrier or at the landings, of falling from a landing onto the hoistway and of falling from the platform during the loading or unloading of goods.

## 6 Management of the hoist installation

### 6.1 General

The hoist installation comprises all parts of the hoist including the drive mechanisms, safety mechanisms, mast and tie arrangements, access to the landings, and hoistway protection at the landings including landing gates, hoistway protection at landing interfaces and at levels where there are no landings, and the base enclosure.

It is essential that the erection, modification and dismantling, thorough examination, operation and maintenance of a hoist installation are properly planned, appropriately supervised and carried out in a safe manner. Once the hazards have been identified (see Clause 5), the risks should be evaluated and, where reasonably practicable, significant hazards eliminated. The risks from any remaining significant hazards should be reduced to an acceptable level by the implementation and management of control measures as part of the planning process (see Clause 9).

## 6.2 Organizational arrangements

The user organization, which is the body that procures the hoist for use on the site (see **3.28**), has primary responsibility for the management of the erection, modification and dismantling, and for the thorough examination, operation and maintenance, of the hoist. The user organization could be the principal contractor on a construction site, the management on an industrial site, or a sub-contractor. It should be noted that persons not employed by the user organization may also be authorized to use the hoist.

A specialist hire company usually supplies the hoist. The safe erection, modification and dismantling of hoists requires input of specialist knowledge and experience from the hoist supplier, together with the user organization's detailed knowledge of the site and intended use of the hoist. Consequently, effective planning and co-ordination between the user organization and the hoist supplier is essential, both before and during the erection, modification and dismantling of the hoist, and for the period of operation and maintenance of the hoist.

The two parties should each appoint, in writing, one person, the "appointed person (user)" and the "appointed person (supplier)", respectively, who have the responsibilities defined in **3.2** and **3.1**. It is recognized that the "appointed person (user)" may need to draw upon the experience, expertise and knowledge of the "appointed person (supplier)" to assist them in the fulfilment of their responsibilities.

**It is very important that regular effective liaison is maintained between the appointed person (supplier) and the appointed person (user) at all times. This is vital during the selection and planning of the hoist installation, when detailed site-specific information and preparation of the site will be required. Even in cases where the hoist is hired through a third party (e.g. a scaffolder) it is still vital for this liaison to be maintained at all times.**

The appointed persons may delegate tasks to other persons where considered appropriate, taking into account the ability, competence and authority of the person concerned. This does not, however, relieve the appointed persons of the responsibility for ensuring that these tasks are completed effectively.

Activities necessary to ensure a safe installation include the following:

- a) nomination of the appointed person (user) (see **6.3**);
- b) identification of the user organization's requirements including hoist type, rated load, height of travel, number of landings, types of load, length of time for which the installation is required, frequency of use (see Clause **9**);
- c) identification of the methods to be used for loading and unloading the goods (see **11.3.3**);
- d) identification of the hoist location (see **9.4**);
- e) specification of the appropriate hoist and selection of a suitable hoist supplier (see Clause **8**);
- f) identification of the organizations that will be using the hoist (see **8.7**);

- g) identification of the persons who will be operating the hoist (see Clause 7);
- h) identification of the training needs of the operators and provision of any necessary training (see Clause 7);
- i) nomination of the appointed person (supplier) (see 6.4);
- j) site surveys (see 9.3);
- k) planning of the installation including pre-erection activities (see Clause 9);
- l) erection of the hoist (see Clause 10);
- m) thorough examination of the hoist (including testing as appropriate) before it is put into use for the first time (see 12.2);
- n) hand-over of the hoist to the user organization, familiarization of the trained operator(s) and supply of information for safe use of the hoist (see 11.2);
- o) day to day management of the hoist operation including pre-use checks and emergency procedures (see 11.3);
- p) maintenance, inspection and in-service thorough examinations (see 11.4 and 12.4)
- q) record retention (see 11.5);
- r) possible modifications to the installation, or changes of use (see 10.4);
- s) planning for dismantling (see 10.5);
- t) review of the dismantling planning (see 10.5);
- u) dismantling of the hoist and removal from site (see 10.5).

These activities form the basis of the responsibilities of the appointed persons as described in 6.3 and 6.4.

It is essential that safe systems of work are established and followed in accordance with 6.5.

### **6.3 Responsibilities of the appointed person (user)**

The appointed person (user) acts on behalf of the user organization and has control of the management of the operation of each hoist. This appointment does not remove any legal responsibility from the management of the user organization but enables them to use this person's expertise to better fulfil their responsibilities. The person appointed may have other duties and need not be an employee of the user organization but should have such training, theoretical knowledge and experience as to enable these duties to be carried out competently (see Table 1).

The appointed person (user) should, as a minimum, do the following:

- a) identify the user organization's requirements, including hoist type, rated load, height of travel, number of landings, types of load, length of time for which the installation is required, frequency of use;
- b) identify the methods to be used for loading and unloading the goods;